

## ABSTRACT

An apparatus and method for measuring pollutants in a vehicle exhaust by remotely  
5 sensing hydrocarbons and nitric oxide using ultraviolet light, and measuring carbon dioxide and  
other pollutants using infrared light. A collimated beam of ultraviolet and a near-infrared light is  
propagated across the road through the exhaust plume of a vehicle. After the light beam has  
passed through the exhaust, a retroreflector reflects the light beam back. A beam splitter passes  
the infrared light to an infrared detector and deflects the ultraviolet light to an ultraviolet  
10 spectrometer. The ultraviolet spectrometer produces ultraviolet signals representative of the  
amount of hydrocarbons and nitric oxide in the vehicle exhaust. The infrared detector produces  
an infrared signal representative of the amount of carbon dioxide and other pollutants in the  
exhaust plume. The spectrometer and detector send the respective signals to a processor for  
calculation of the amounts of pollutants in the exhaust. A camera is used to take a picture of the  
15 license plate of a vehicle that emits too many pollutants.